

Giacomo Becattini and the Marshall's method

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ABSTRACT: The studies of Giacomo Becattini concerning the notion of the «Marshallian industrial district» have led a revolution in the field of economic development around the world. The paper offers an interpretation of the methodology adopted by Becattini. The roots are clearly Marshallian. Becattini proposes a return to the economy as a complex social science that operates in historical time. We adopt a Schumpeterian approach to the method in economic analysis in order to highlight the similarities between the Marshall and Becattini's approach. Finally the paper uses the distinction between logical time, real time and historical time which enable us to study the «localized» economic process in a Becattinian way.

JEL Classification: B31; B41.

Keywords: Giacomo Becattini; industrial district; Marshallian industrial district, economic methodology.

Giacomo Becattini y el método de Marshall

RESUMEN: Los estudios de Giacomo Becattini relativas a la noción de «distrito industrial marshalliano» han provocado una revolución en el campo del desarrollo económico en todo el mundo. En el documento se ofrece una interpretación de la metodología adoptada por Becattini. Las raíces son claramente marshallianas. Becattini propone un retorno a la economía como una ciencia social compleja que opera en el tiempo histórico. Adoptamos un enfoque schumpeteriano al método de análisis económico con el fin de poner de relieve las similitudes entre el enfoque de Marshall el de Becattini. Por último, el trabajo utiliza la distinción entre tiempo lógico, tiempo real y tiempo histórico que nos permite estudiar el proceso económico «localizado» de una manera Becattiniana.

Clasificación JEL: B31; B41.

Palabras clave: Giacomo Becattini; distrito industrial; distrito industrial Marshalliano, metodología económica.

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1. Introduction and aims

Giacomo Becattini has been one of Italy's most influential social scientists world-wide during the last twenty-five years. His contributions to the history of Marshallian economic thought and to the field of local economic development are internationally acclaimed. Few Italian economists have provided such a lucid interpretation of contemporary economic processes.

His studies concerning the notion of the «Marshallian industrial district» have opened up new perspectives in the analysis of local economic development. This has led to a revolution in a wide range of research areas in territorial economics, both theoretical and applied, and to abundant literature of high quality. I can attest to the fact that the notion of the «industrial district» has gone, in just thirty years, from being a tool of very limited use among experts in the field of industrial economic thought to being a widely-used concept for economists concerned with economic development and industrial policy.

It is now three decades since the appearance of the seminal article, «Dal “settore” industriale al “distretto” industriale. Alcune considerazioni sull'unità di indagine dell'economia industriale» which was published in *Rivista di Economia e Politica Industriale*, No. 1, 1979¹. In this article, Becattini explains some of the central ideas published in his most important, previous work, *Lo sviluppo economico della Toscana* (1975), which he carried out at the IRPET (Istituto Regionale per la Programmazione Economica della Toscana). In this document on the industrial development process, Becattini formulates a discourse, that is ahead of its time by more than a decade, which provides an interpretation concerning the core of endogenous growth theories: defined as the existence of a «mechanism for the creation and transmission of economies external to the firm but internal to the industry, operating through the proliferation of small and medium-sized companies at different stages of a given production process».

Becattini proposed the term «Marshallian industrial district» for this phenomenon which can only be partially accounted for by Alfred Marshall in his *Principles of Economics*.

Just as we must distinguish between the economics of Keynes on the one hand and Keynesian economics on the other, in my view we need to distinguish between the industrial district in Marshall and the Marshallian industrial district. Becattini goes much further in his analysis of the industrial district than the one proposed by the great Cambridge economist Alfred Marshall. As Becattini notes in the last section of his seminal 1979 article: «Now I have introduced my proposal clothed in Marshall's robes»². Becattini proposes changing the ways of analyzing localized economic processes (see also Becattini 2002).

¹ English version: «From the industrial “secto” to the industrial “district”: some remarks on the conceptual foundations of industrial economics» at Giacomo Becattini (2004). The English version contains some changes that affect the title and the contents respect the Italian original version.

² Translated from the Italian version.

However Becattini's contribution to the development of current economic analysis goes much further than proposing a field of study and accurately defining its limits in order to interpret local economic development. I think the great contribution of Professor Becattini is to propose a method of economic analysis in the tradition of Cambridge which marks the return to a way of doing economics that has been virtually outlawed in the day-to-day practice of the economist.

For Becattini, the political economy, the economic analysis in Schumpeterian terms, goes beyond theory and the contrasting of theories. He does not only propose «a return to the territory», and a new approach to the area of study concerning industrial analysis, but also a return to the economy as a complex social science that operates in historical time, capable of emphasizing «social depth» and «cultural outreach» in empirical research, and of addressing this complex reality together with other disciplines such as history, geography and sociology.

Perhaps what stands out most is Becattini's ability to understand economic discourse in the way Marshall does. This is more important than the concepts taken from the box of tools in the tradition of Marshallian economy such as the industrial district, the notion of human character, the firm as a social entity and external economies.

In the first place, I will argue that the Becattini's career as a researcher corresponds exactly to the ideal of the «complete economist» at Cambridge. The issue is not just about whether his proposal concerning the «industrial district» is original but if his scientific method corresponds to the Cantabrigiensis ideal.

What follows is a discussion of the unit of analysis needed to deal with contemporary economic development: the Marshallian industrial district. I will use a Robertsonian interpretation.

Finally, we adopt an Schumpeterian approach to the method in economic analysis in order to highlight the similarities between the Marshall and Becattini's approach. To conclude, the paper ends with a consideration of the notions of logical time, real time and historical time. These notions emerge from the approach taken by Marshall, Keynes and Schumpeter which enable us to study the «localized» economic process in a Becattinian way.

2. Giacomo Becattini: a complete economist. Concerning Marshall's method and Becattini

In order to understand Giacomo Becattini we need to see his work in the context of Marshall and the Cambridge school. Becattini's method links up with Marshall's method. It represents a search for a way of proceeding which explains the economy and which includes induction, deduction and history, and places the very tools of analysis in their historical context. In this sense, the ideal of the «complete» economist which Keynes refers to characterize Marshall is perfectly attributable to Giacomo Becattini.

Let us briefly consider Marshall's method. We will start with the authoritative text of John M. Keynes. In Keynes' obituary of Alfred Marshall, Keynes explained his ideal of what a multifaceted or complete economist should be by referring to the singular combination of qualities that he found in Marshall.

«In another respect the diversity of his [Marshall] nature was pure advantage. The study of economics does not seem to require any specialized gifts of an unusually high order. Is it not, intellectually regarded, a very easy subject compared with the higher branches of philosophy and pure science? Yet good, or even competent, economists are the rarest of birds. An easy subject, at which very few excel! The paradox finds its explanation, perhaps, in that the master-economists must possess a rare combination of gifts. He must reach a high standard in several different directions and must combine talents not often found together. He must be mathematician, historian, statesman, philosopher in some degree. He must understand symbols and speak in words. He must contemplate the particular in terms of the general, and touch abstract and concrete in the same flight of thought. He must study the present in the light of the past for the purposes of the future. No part of man's nature or his institutions must lie entirely outside his regard. He must be purposeful and disinterested in a simultaneous mood; as aloof and incorruptible as an artist, yet sometimes as near the earth as a politician. Much, but not all, of this ideal many-sidedness Marshall possessed. But chiefly his mixed training and divided nature furnished him with the most essential and fundamental of the economist's necessary gifts—he was conspicuously historian and mathematician, a dealer in the particular and the general, the temporal and the eternal, at the same time» (Keynes, 1936/rep. 1989, vol. X, pp. 173-174).

Note that Keynes not only refers to the need for the economist to be able to use tools of economic analysis such as mathematics, history, statistics and logic at the highest levels, but also to go beyond the strictly professional, combining action with neutral disposition. If it is true that no aspect of human nature or its institutions must lie outside the brief of economist then the job is one of enormous complexity at which few excel. No wonder then that good economists (or just competent economists) are the rarest of exotic birds.

Subsequently, Keynes himself, in his address delivered at the Royal Statistical Society on April 21, 1936 to mark the centenary of the birth of William Stanley Jevons, more accurately summed up the skills or qualities that in his opinion characterized the complete economist, namely the different qualities that should be found in a good economist:

«In my memoir of Alfred Marshall I called attention to the many-sidedness which seems to be necessary equipment for an economist. Jevons was certainly a notable example of this. To his scientific and experimental training which led him to his inductive studies and his logical and analytical bent which led him to his deductive studies there was added an unusually strong historical, and even antiquarian, bias. From his earliest days Jevons had a native inclination to carry his inductive studies backwards in point of time, and to discover the historical origins of any theory in which he was interested» (Keynes, 1936/rep. 1989, vol. X, p. 129).

We are dealing with a systematization of the methodological approach of the economist—and by extension, the economy—which coincides almost exactly with the one that Schumpeter would develop afterwards and, as we shall see, which characterizes the view and the claims of Giacomo Becattini³.

³ Jevons, Keynes and Schumpeter have something else in common: at the beginning of their training as economists they developed a solid background in the philosophy of science or logic and they

The work of an economist, and in particular an economist working in applied fields and who is attempting to attain a mastery of the economic process must operate, according to Keynes, in three major areas or aspects of study: the deductive, the inductive and the historical.

But the task of the economist does not end there. The economist —both the theoretical and applied one— must know the origins of the theories being used. The history of economic analysis is a tool which allows one to understand how economic concepts evolve, the context in which various theories are developed, the interrelationships between these analytical tools and economic problems that the economist must try to solve and which are subject to changes over the course of time.

The aim of the economist must also be to understand the highly complex economic process. The motivations of the economist are generally beyond the control of a technical or detailed knowledge of a particular part of reality. When Schumpeter explains the grounds on which Marshall will be remembered in the history of economic analysis – in the words of one of his favourite expressions: «occupy a permanent seat on the big bus of economic science» —he affirms:

«Marshall is not only a high-powered technician, a profoundly learned historian, a sure-footed framer of explanatory hypotheses, but above all a great economist. Unlike the technicians of today who, so far as the technique of theory is concerned, are as superior to him as he was to A. Smith, he understood the working of the capitalist process» (Schumpeter, 1954, p. 914)⁴.

Marshall's methodological design is masterfully summed up in a letter to Edgeworth and from which we selected the following passage:

«General reasoning (i.e. “theory”) is essential, but a wide and thorough study of facts is equally essential, and the combination of the two sides of the work is alone economics prover» (Becattini 1993).

published works of great importance in these fields. For Jevons, whom Schumpeter described as «very able and logical as an economist,» half of his scientific output is related to logic. The Treatise on Probability by John Maynard Keynes is an important contribution to the development of probability theory. The early work of Schumpeter *Das Wesen und der Hauptinhalt der theoretischen Nationalökonomie* published at the age of twenty-five systematically explores the methodological foundations of economic theory. Not in vain was economics born as a moral science, and economists, especially the British ones, systematically explored the philosophical side.

⁴ Marshall's influence (particularly on the use of mathematics as a primarily heuristic tool) also seems relevant: Harrod, like Skidelsky (e.g. 1986), have both shown that Keynes —like Marshall— was fluent in the language of mathematics. Although Marshall was not a cutting-edge mathematician he had a sound understanding of mathematics. But Marshall did not understand that the presentation of economic theory in mathematical form was the best way to simplify the language, saving words, and even finding heuristic values. On this non-explicit use of mathematics in the economy, Marshall's recommendation (creator of the diagrammatic economy) is very significant: «In my last years of work on the subject I had the growing feeling that a good mathematical theorem about economic hypotheses would probably not be a good economic theory, and so I tried to use the following rules more often: 1) Use mathematics as short hand and not as a tool to discover the truth. 2) Retain them until the completion of work. 3) Translate the work into English. 4) Produce images which are important in real life. 5) Burn the mathematics. 6) If there is no success with 4, burn 3. I often burnt 3».

Professor Giacomo Becattini (1993, p. 17) has expressed Marshall's basic methodological message as follows:

«The right method of inquiry of Political Economy is a dialectic spiral between deduction and induction, theory and empirical research, allowing room for disciplined imagination and not resorting to blind algorithm. The *Esprit de finesse* must help and correct continuously the *esprit de géométrie*. Lightness of touch and sense of proportions are all simultaneously required to be a good economist. Only this combination of qualities allows the modern economist to nourish his theory with new facts and to illuminate his facts with new theories».

In my opinion, Giacomo Becattini's professional career responds to the view expressed in the quote above. In the first place, this is reflected in his work in the field of economic theory, *Il concetto di industria e la teoria del valore* in 1962 and his many studies on local development models and, of course, the theory of the Marshallian industrial district. His applied studies on the Italian reality in general and particularly the Tuscan one, that will change the way we understand the manufacturing process and the Italian development model, are part of this methodological design. Finally, his view is expressed in his work on the history of economic thought.

To conclude this section, I must emphasize the importance of historical method in the thinking of Giacomo Becattini and particularly Fernand Braudel's method or the Annales school. As he writes in his paper «Per una critica dell'economia contemporanea. Alcune considerazioni e una proposta»:

«ritengo l'opera di Braudel come una delle grandi fonti ispiratrici del movimento per la ricomposizione del sapere sociale» (Becattini 1990, p. XVI).

In his introduction to the Spanish edition of *Il bruco e la farfalla* (*The caterpillar and the butterfly*)⁵, Becattini cites Braudel:

«Every historian must have a territory, a chosen city, a privileged observatory, well known, from which to try to see the destiny of the world better».

In *Il bruco e la farfalla* (*The caterpillar and the butterfly*) (2000) Becattini updates the fourth volume of this monumental collective work *Prato. Storia di una città*, coordinated by Fernand Braudel.

In short, Giacomo Becattini is positioning himself in the wake of Marshall's methodology and seeks and attains the know-how of the complete economist. He systematizes the concepts that will be used in his analysis, unfolding his economic thinking about deductive methods, notably his theory of the industrial district. He develops knowledge of the reality using statistical and historical databases, about the economic reality in Italy and particularly about Italian cities. He integrates deduction and induction in this analysis of the reality, including in it, a masterly study of the development process of Prato.

⁵ *La oruga y la mariposa. Un caso ejemplar de desarrollo en la Italia de los distritos industriales* (Publicaciones de la Universidad e Valladolid, 2005). The book has also an English translation: *The caterpillar and the butterfly. An exemplary case of the development in Italy of the industrial districts* (Felice Le Monnier, 2001).

But just like his admired Miguel de Cervantes in *Don Quixote*, he sets the action in the territory, but above and beyond the territory: «Somewhere in La Mancha in a place whose name I do not care to remember ...» and builds a universal novel from a local story. Becattini, in his study of Prato, in a similar way to Cervantes, analyzes the contemporary industrial economy through the study of a specific local context. His studies transcend the local to find the universal.

In addition, Becattini follows in the wake of the great economists of Cambridge, since not only was he concerned with the analysis of economic reality but he also actively participated in the social process, by writing for print media such as *Il Sole 24 Ore* or magazines of a social or political ilk such as *Il Ponte*.

Finally Becattini considers Marshall's work to be of supreme importance in the sense that he saw the need to maintain an on-going dialogue between the economic and the ethical. The economist must be imbued with values. And their actions must ensure economic policy proposals which aim to enhance humanity's progress.

3. The unit of analysis: Becattini's proposal for a Marshallian industrial district

In my opinion, the real merit of the Becattini's proposal lies in what we know as the «Marshallian industrial district». We will adopt a «Robertsonian» interpretation of his ideas, stressing the importance of the possibility of increasing manufacturing returns from territories and areas equipped with external economies and small and medium-sized firms. So I will propose an interpretation of the reasons for the international success of the theory of the Marshallian industrial district, especially in areas which are not dominated by large industrial companies as in Spain (Catalonia, Valencia) and many countries which have industrialized somewhat later like China or Russia. This kind of success transcends scientific knowledge and is expressed in the form of new development policies based on the theory of the industrial district, as in Spain's case.

The term «Marshallian industrial district» has been at the centre of an interesting theoretical and empirical debate which started in Italy in the late 1970s until the present. Thanks to Giacomo Becattini, the notion of industrial district has grown to influence areas such as international trade (Paul Krugman)⁶, economic geography (Allan Scott and Michael Storper), development theory (Ash Amin and Kevin Robins) and the theory of the firm (Maria Teresa Costa)⁷. In Italy the work of the «Florence School» (Giacomo Becattini and his associates: Marco Bellandi, Gabi Dei Ottati, Fabio Sforzi) has helped to disseminate the method of analysis proposed by Becattini. Empirical studies have ensued from the work of Luigi Federico Signorini, researcher at the Bank of Italy, and Fabio Sforzi.

⁶ Paul Krugman back in 1994 devotes the bulk of chapter nine «The Economics of QWERTY» to the question of the industrial district) (pp. 221-224).

⁷ An analysis of the Marshallian concept of industrial district, which takes account of major districtual developments until 1989 is to be found in Trullén (1990).

Today the term «industrial district» is present in much of the literature on local development not only in Italy but a significant part of European countries and other parts of the world, including China, Latin America and Africa⁸.

At root, there is the perception that certain Italian industrial cities located in the northeast and centre of the country responded with greater success than the big industrial cities of the north to the challenges of the economic crisis of the seventies. It is characterized by the existence of a strong network of small and medium-sized companies open to international competition and specializing in the production of consumer goods or producer goods, with irregular and unpredictable demand. Cities such as Prato, Bologna, Ferrara and Ravenna and nearby areas of influence, proved more responsive to the crisis of the seventies than the industrial cities of the Milan, Turin and Genoa triangle. To what extent was this anomaly, or was it in fact a case study that needed further investigation? Becattini's answer was very clear: the behaviour of cities such as Prato and Bologna was similar to the behaviour Marshall had observed in certain English industrial cities in the late nineteenth century: Sheffield, Nottingham, Birmingham or Manchester. They managed to compete effectively without the need for vertical integration used in production of goods by large firms. Marshall proposed defining these industrial cities as «industrial districts.»

The key theoretical characteristics of industrial districts according to Becattini are as follows: they are systems which are open to international competition, must base their production on industrial activities, and not necessarily focus on one sector, but rather on an activity which contributes to very different sectors or industries. The firms must be in competition with each other because otherwise the district would tend to concentrate the activity in one or a few large companies.

The industrial district must have an industrial atmosphere, internally generating a wide range of positive external economies. These external economies are of a very different type. They affect the transmission of information, innovation and technology. They also affect the labour market, providing specific and generic training characteristic of the dominant activity in the district. Furthermore, in the district the costs are shared by different companies which make cost analysis production of a single firm largely irrelevant: production becomes efficient because it is joint production.

These economies which are external to the company, considered on a small, individual basis and internal to the industry of the entire district are more productive than competitors based in a large company and outside the district.

Changes in technology and the internationalization of the markets since the mid-seventies and great variation in demand, have endowed the towns with substantial advantages in relation to their competitors in the style of the industrial district.

However, there are two essential characteristics regarding the industrial district that I would like to emphasize: first the existence of increasing returns; and second,

⁸ See the special issue dedicated to 25th anniversary of the theory of Marshallian Industrial District, *Economía Industrial*, Madrid, 359, «El Distrito Industrial Marshalliano: un balance crítico de 25 años», 2006.

the importance of territory and history that explains the continuity of industrial production⁹.

In my view, the existence of increasing returns needs to be reconciled with competitive market practices. This possibility, identified by Dennis Robertson as the «dilemma of Robbins», required the presence of dynamic external economies. Indeed, using Marshallian assumptions regarding external and internal economies, it was possible to identify, within the domestic economies or increasing returns, two alternative development paths:

1. increasing returns to scale,
2. and increasing returns based not on the scale of production, but on the standardization of certain external economies as a model¹⁰.

Sraffa had stated that the existence of increasing manufacturing returns led inexorably to a concentration of the industry. In his view, while it was theoretically permissible to expand the possibility of increasing returns through the spread of external economies, this fact was in practice, in Sraffa's view, non-existent or irrelevant. Thus Sraffa's model does not even address this possibility, and says furthermore that the presence of important externalities would cancel out the competitive model.

Dennis Robertson, in opposition to Piero Sraffa, developed an alternative theory, which reconciles the existence of external economies with the existence of competitive market practices: the so-called «internal and external Robertsonian economies» (See Robertson, Sraffa and Shove, 1982).

Becattini's contribution to Fernand Braudel's study of the economy of Prato restates the question: was it possible to identify industrial systems that could respond to competition from large companies with increasing returns due to the development of external economies? They could scale up production while maintaining their competitive conditions. These were the Marshallian industrial districts.

But Becattini's contribution is not just the importance of re-applying an old concept lying in the bottom of the toolbox of economic analysis. The value of his approach lies in my opinion in his proposal to change the unit of investigation in the field of industrial economy using this concept of the importance of place and, in passing, the unit of intervention in terms of industrial policies. The difference is this: what matters is not the sector where production occurs but rather the place. To understand

⁹ The importance of increasing returns in industrial returns has been one of the most controversial part of applied economic research over the last sixty years. If increasing returns is significant, then the competitive model may be an inappropriate one to explain the how industrial markets work. Throughout the thirties, and in the pages of *The Economic Journal* there was an intense debate about the importance, even existence, of increasing returns, in what historians of economic analysis have been described as «the controversy of the empty boxes». If it was accepted that in a significant number of industrial sectors the shape of the dominant market was not competition but the oligopoly or monopoly, then it was necessary to rethink the whole micro-analytical system generally regarded as unrealistic and based on this competitive model. See a discussion on this issue in the field of Regional Science in the article by Sforzi and Boix in this same special issue.

¹⁰ See Robertson, Sraffa and Shove (1982), pp. 62-93. This point has been developed by Muñiz (1993).

the scope and continuity of many industrial activities it is more useful to consider the place where the process of production takes place instead of the sector.

Becattini criticizes the notion of the productive sector for the purposes of the study of the industrial process. The Marshallian industrial district defines a radically different field of research and intervention. In his task of studying the capitalist economic process he suggests approaching the work from a perspective on the territory. In this way the economic historical process is localized.

The consequences of this approach to applied economic research are much more significant than was expected in the first instance. They open up the possibility of finding different ways of approaching industrial development based not on a vertically integrated industry in the style of François Perroux, but in small and medium-sized firms in the growth of external economies, and with openness to international competition. The theses of Michael Porter, Michael Piore and Paul Krugman which are disseminated in international university forums, such as the University of California, and non-university ones, such as the ILO (International Labour Organisation), or the G7 meetings presided over by President Clinton are derived from proposals by Becattini.

This approach provides industrial analysis with a new spatial perspective, and opens up the possibility and in some cases the need to study the industrial process from the territory by investigating hundreds of industrial processes on a one-by-one basis and studying the industrial process located in a particular place or territory, the cradle and the destiny of external economies.

4. From Marshall to Schumpeter: A Schumpeterian vision of the economy

In recent years, an interesting methodological discussion has taken place between economic historians and evolutionary economists about the method used by Marshall and Schumpeter, and the pervasive influence of the German Historical School (See Shionoya and Nishizawa, 2008).

Schumpeter's concern to build an economic science, in an evolutionary key with a leading role for the historical method, is analyzed by Yuichi Shionoya (2008, p. 15) for whom:

«[Schumpeter] placed the economy in the wider context of social life and attempted to provide a comprehensive vision of the evolution of society as a whole, which was to be addressed by a universal social science, covering such areas as the economy, politics, social relations, the arts, science and morality».

Schumpeter first used this evolutionary approach in his *Theorie der Entwicklung wirtschaftlichen* published in 1912, together with the key notion of innovation.

Schumpeter's concern regarding methodology extends throughout his whole life as an economist. But in my opinion, it is in his posthumous «History of Economic Analysis» published in 1954 which systematizes his views on method in economic

analysis in terms that not only bridge the gap between Schumpeterian analysis and Marshall's approach but also characterises Becattini's work.

So far no one has carried out such an enormous and fruitful study of economics¹¹ in the same way as Professor Joseph Alois Schumpeter has in his monumental *History of Economic Analysis* (1954). And yet, this work was developed from a methodological design that forty years ago might have seemed unusual, even unorthodox: the impossibility of identifying just one yardstick to allow the classification of the various sciences and branches of knowledge in a systematic way¹².

The scientific method, which has become increasingly specialized, does not operate according to a rational plan, predetermined or not, so that «science as a whole has not ever been consistent logical architecture, but instead a tropical jungle, not a building which is constructed according to plans» (Schumpeter, 1954, p. 45)¹³. The economy is no exception to this general principle, and in fact complies with it to the full. It is not a closed, well-defined science in the way acoustics is but «rather an accumulation of poorly coordinated and overlapping research fields in the sense that it is “medicine”» (Schumpeter, 1954, pp. 41-46).

According to this view, science is «any kind of knowledge that has been the subject of a conscious effort to perfect it». Through this process of perfection, certain habits of mind develop (or methods or «techniques») and a command of the facts discovered by these techniques. It is therefore possible to redefine science as «any field of knowledge that has developed special techniques for finding facts and interpretation or inference (analysis).» It therefore requires the existence of a community of researchers that are distinct from the ignorant or the inexperienced person in the domain of those facts or techniques¹⁴.

Schumpeter's methodological position differs from the usual assumptions about analytic philosophy (Schumpeter precedes Popper chronologically speaking), aligning himself more with logical positivism (which is contemporary), but with a signif-

¹¹ On Schumpeter as a person and his work see the obituary by Paul Samuelson in the AER. In Spain the dissemination of Schumpeter's ideas, was largely due to Professor Fabian Estapé, and his translators, the philosopher Manuel Sacristán (HEA), Jesús Prados Arrarte (for the translation into Spanish) and Antoni Montserrat and Jaume Casajuana (into Catalán). An excellent interpretation of the Schumpeterian system of thought is to be found in the introduction by Fabián Estapé to the work «Capitalism, Socialism and Democracy», in which, to paraphrase Schumpeter himself, he suggests that Schumpeter's collected works are one of the few major works of contemporary economic thought. Schumpeter (1942, pp. 5-28).

¹² Classification (or division) constitutes together with definitions and induction, one of the three core areas of traditional formal logic, prior to Popperian analytic logic. Concerning the relations between these concepts Professor Sacristán (1973) has written: «All three are interrelated in the methodology of science: the division (or classification) often provides elements for definition... In turn, definition requires the extension, for example, of a number of phenomena, and therefore could be the starting point of a division of these phenomena, and also a prerequisite for any general statement (obtained by induction) regarding these phenomena. Conversely, the inductions obtained refine the definitions to enrich our knowledge of the phenomena studied».

¹³ The use of a biological metaphor, especially those concerning the plant kingdom is traditional in economic analysis, particularly for the Cambridge school of thought (UK): Marshall and Robertson, are key references in this respect.

¹⁴ Here Schumpeter clearly anticipated the thesis of Thomas Kuhn (1962).

icant nod to history. We will try to explain some of its basic propositions which are different from the standard view of analytic philosophy.

Modern scientific procedure has been traditionally characterized by the identification of verifiable facts that can be observed, while admissible methods were found in the field of logical inference. Faced with this basic thesis which the Vienna Circle philosophers defended (notably Wittgenstein and Carnap) and in connection with the assertions that they made in relation to criteria for empirical verification of scientific statements or propositions of a synthetic nature¹⁵, Popper posed the idea of a fundamental asymmetry between verification (induction) and falsification (deduction)¹⁶. Hence Popper characterizes science by the use of hypothetical-deductive method.

We can explain the Schumpeterian method as an approach that allows us to combine the formerly dominant positivist philosophy with the falsificationist approach still in play. It uses the hypothetical-deductive method for the presentation of theories, recognizes a role for the inductive method in applied fields and, in particular, statistical contrast and emphasizes the open nature, and therefore historical nature of economic analysis¹⁷.

For Schumpeter, the elements that distinguish the scientific economist from the rest of the people who think, speak and write about the economy «is the mastery of techniques classified under the three general headings of history, statistics and theory. The three together constitute what we will call economic analysis» (Schumpeter, 1954, p. 47).

Let us distinguish between the Schumpeterian conception of science from the Popperian one presented in *The Logic of Scientific Discovery* (Popper, 1959). The latter will pose a fundamental methodological problem regarding the choice of method or methods of inference. The father of the analytic school, the Austrian philosopher Sir Karl L. Popper, in his research program on inductive inference¹⁸ would suggest doing away with inductive inference, replacing the induction principle for falsifiability as the criterion for demarcation, in keeping with the theory of hypothetical-deductive method. According to this view, science is characterized by way it formulates or contrasts its propositions. The object or material that is studied does not define science.

The Schumpeterian concept of «science» is different from the Popperian conception. Science is not classified or defined by its methods or by object. Science in

¹⁵ For logical positivism, a proposition can be analytic or synthetic. An analytic proposition would be true through definition in its own terms. In contrast, a synthetic proposition would be true through experience. Hence, a synthetic proposition requires empirical verification (See Blaug 1990).

¹⁶ Popper (1935, p. 33): «In this book I intend to give a more detailed analysis of contrasting deductive methods and try to show that all the problems that are often called “epistemological” can be dealt with in the framework of this analysis. In particular the problems that arise from inductive logic can be overcome without giving rise to new ones in their place».

¹⁷ An application of the Schumpeterian method to the Spanish economy can be found in the introduction of Trullén (1993).

¹⁸ Regarding the context in which Popper considers —with Bertrand Russell— solving (or demolishing) the problem of induction, see the introduction and postscript to *The Logic of Scientific Discovery*. Chapter 1 is devoted to the Problem of Induction.

general and economics in particular, is a set of skills or habits of thought, methods or techniques that scientists or researchers carry out trying to improve «the stock of existing facts and methods and during this process, master some of the skills and methods unlike the “layman” or the mere “practitioner” in relation to that knowledge» (Schumpeter, 1954, p. 42).

The existence of verifiable facts and the need to apply the rules of logical inference by starting with the existence of these verifiable facts, allows us to distinguish scientific procedure from other branches of knowledge or procedures.

Furthermore, in the case of economic science the subject is historical. The economy would be a «continuous historical process, so that the economy of different eras is largely a different sets of facts and problems» (Popper, 1959, p. 40) This philosophical conception of «science» refers, then, to a conception of economics as a historical process.

We can now sum up the main defining elements of this Schumpeterian conception of economics.

First, we must distinguish economic analysis from economic thought. There are many considerations regarding economics that are not scientific in nature and yet may be of interest to understand certain economic mechanisms. They constitute thoughts regarding the economy, but do not constitute economic analysis.

Economic analysis is composed primarily of economic history, statistics or a set of methods for measuring economic phenomena, and theory¹⁹.

Economic history brings to the economy, a social and institutional dimension that characterizes it, in contrast to the so-called experimental sciences. For Schumpeter it is the most important of the three key economic fields. This is for three reasons. First, one cannot understand economic phenomena without a historical context: the economic facts change over time. Second, economic history facilitates understanding of relationships between economic and non- economic events, in particular to identify relevant institutions for a proper economic diagnosis. And in third place it offers historical experience to economic analysts, thus allowing them to avoid many of their perennial mistakes (See Schumpeter, 1966, pp. 330-331).

On the role of economic history according to Schumpeterian economic analysis, and illustrative of the complex relationship established by the theory, we give an example by using the very proposal of Schumpeter himself in one of his later works. It is the study of business cycles and in particular of the existence of changes in the production function and the consumption function. On the role of historical research in economic analysis, Schumpeter wrote in one of his last works:

«What is needed is a wide collection of industrial and locational monographs all written under the same auspices and giving proper attention on the one hand to the incessant historical change regarding production and consumption, and secondly the quality and performance of senior staff».

¹⁹ Additionally Schumpeter recognized economic sociology as a proper field within Economic analysis. Schumpeter (1954).

We can observe from this last excerpt from Schumpeter's work that he proposes not only the study of the industry but also the locations. Becattini's proposal to study the Marshallian industrial districts can be seen in the light of this Schumpeterian proposal.

Later, Schumpeter also wrote:

«You must refer to industrial history in a way that, (once the analytical work has been carried out), provides checks, comparisons, digressions, designations, and also tells us where we can expect the oscillatory movements to play a role. The theoretical and statistical analysis is in this sense as necessary as the historical research» (Schumpeter, 1966, p. 331).

A set of procedures or data sources are a fundamental part of economic analysis, and particularly for applied economic analysis. This set of procedures may include very broad statistical domains, such as descriptive statistics, theoretical statistics, sampling theory and actuarial statistics. The collection of econometric fields, such as the method of least squares, simple regression, multiple regression, probit and logit models, simultaneous equations models, models of expectations, among others such as time series models and models based on co-integration.

No one can question the relevance of quantitative methods in current economic analysis. Schumpeter in 1933, in the first article of the first issue of *Econometrics*—a Journal published by the «Econometric Society»—said: «We have these beliefs and only these beliefs in common: first, that economics is a science, and second, that science has a very important quantitative (Schumpeter, 1933, pp. 5-12) element». The quantitative elements in economics have been widely developed in economic analysis based on the development of statistical sources, the progress of statistical and econometric tools, and computer systems.

The term «theory» often encompasses two distinct notions. First, the reduced set of hypotheses or general postulates of science. Secondly, the comprehensive set of «primitive notions», assumptions, axioms, and theorems which make up a science. We must always be vigilant as to which of those two concepts is being used in order to avoid confusion.

It is widely acknowledged in the debate on method in economics that the best definition of economic theory is one proposed by the Cambridge economist Joan Robinson: economic theory is a box of tools (Robinson, 1933). In the exercise of scientific research on a daily basis, theoretical or applied, this instrumental view of economic theory acquires its full meaning. A knowledge of a wide range of instrumental hypotheses, axioms, laws, and statements derived from the hypotheses and theorems is a fundamental requirement to do economic research. Learning to select one or more relevant analytical tools for each problem is probably the most subtle and complex challenge for a researcher, and especially subtle and complex in Applied Economic Research. In this sense, the first definition of theory is less crucial than the second for the purpose of studying the fundamentals of applied economics.

Hence, just as it is not possible to understand economic analysis without economic theory, nor is it possible to conduct applied economic research without identifying the relevant theoretical tools beforehand.

5. The economy as a process: logical time, real time and historical time. The combination of rigour and relevance

In economic analysis, and in applied economic analysis in particular, it is necessary to distinguish three radically different notions of time: the notion of logical time, the notion of real time and the notion of historical time. This distinction may allow for the identification of a relationship which is more complex than the one usually recognized between economic theory and applied economics, and which postulates the need to go far beyond the mere relationship between theory and the process of testing it. We will explore in this section some of the developments in these categories²⁰, with the intention of illustrating attempts to explain what Schumpeter called «a theory of economic process» that would constitute the «economic theory of the future».

This distinction may be useful in understanding the method used by Giacomo Becattini in his work and especially the theoretical and applied explanation of the «Marshallian Industrial District». It is the study of the economic process sited in specific locations, and explained in historical time.

Schumpeter's proposal is to build a theory of economic process understood as «development of inner drive, in historical time, a process that at every moment is a situation that determines the next one» (Schumpeter, 1942, p. 33).

To distinguish between the notions of logical, real and historical time we must incorporate in the analysis one of the fundamental methodological improvements of the twentieth century. It is proposed by John Maynard Keynes, built on his probability theory expounded in his early work *Treatise on Probability*, developed extensively throughout his life and incorporated in his *The General Theory of Employment, Interest and Money* in 1936.

Indeed, the role of time in economic analysis has undergone a fundamental change since the advent of the General Theory of Keynes. Although Marshall's distinction between short term and long term²¹ is the first systematic attempt to raise the issue of economic dynamics in a different way from the classical economists, it is generally considered that the treatment of time in the *General Theory* is one of Keynes fundamental differences with Marshall's view.

Thus Joan Robinson, in his book *Economic Philosophy* (1962), affirms that Keynes has returned the notion of time to economic analysis. Indeed, the twenty-second chapter of the *General Theory* is dedicated to the business cycle using a dynamic notion of time that is linked to endogenous or exogenous economic processes (such as the evolution of the population).

²⁰ Especially the principles of Paolo Sylos Labini (1992, pp. VI-VII). This paper is a reworking of his previous papers with the aim of integrating the papers published between 1967 and 1982. A survey of the work of Sylos Labini can be found in Trullén (1988).

²¹ Marshall in his preface to the *Principles* states that the time is at the centre of the main difficulties of almost every economic problem.

The dynamic of the cycle, the dynamic of the peaks and troughs, in the upward and downward movements performs—in the Keynesian approach—in accordance with «some degree of regularity in the sequence and duration of the upward and downwards movements» (Keynes, 1933, pp. 279-280).

However, economic crises appear so suddenly and violently, and respond to fluctuations in the marginal efficiency of capital that they constitute a category which is only partly possible to predict and quantify. The economy must be understood in their dynamics, and money is «the link between present and future» (Keynes, 1933, p. 261).

In contrast with models that assume instantaneous and hypothetical variations, this model would give real time, time that allows the economic dynamic, in which peaks and troughs really occurred in the business cycle. Sylos Labini's proposal is denominate the abstract time of prekeynesian theoretical models as «logical». By contrast the time of economic dynamics of Keynes would termed «real» (Sylos Labini, 1992, pp. VI-VII).

The development of Keynes's ideas required fixing time as a category, in order to manage the variables for the models properly. This led first to development of models based on comparative statistics, and subsequently the development of dynamic models to reach a high level of refinement in the chaotic dynamics (Baumol and Quandt, 1985).

However, for the economist Sylos Labini—a disciple of Schumpeter—there would be a third category of a different kind of time to «real» time: this is historical time. This category responds to the use of time in the theory of economic process as proposed by Schumpeter. It is a method of explaining the economy similar to the way classical economists do or similar to path dependence, which allows the gap between economic theory and history to be bridged.

This notion of «historical» time comes close to the concept of time that Dennis Robertson uses in his theoretical and applied work, which has been termed «the Robertsonian dynamic» (See Trullén 1985 and 1993) or «dynamic period» and has attracted the attention of both Keynesian (Leijonhufvud, 1966) and monetarist economists (Wilson, 1980).

The Robertsonian method ignores the use of mathematical explanation, and alternates between the hypothetical-deductive and inductive method, as his master Keynes does, with less concern for perfection and the formalization of the models than for their explanatory power²². Robertson's work goes through sequential chains, according to a period analysis or Robertsonian analysis as Leijonhufvud names it. Robertson methods remove him from historicism and mathematical formulation.

Becattini's work must be placed in my opinion in the same category as the methodological developments of the Cantabrigiensis school from Keynes to Robertson

²² On Robertson's work see the work of John Presley (1978, 1984). Some of the very few works by Robertson have been translated by the Research Department of the Bank of Spain, and probably influenced the way the Bank of Spain presents the economy.

and Joan Robinson. They are inspired by Marshall's method initially, but go far beyond it. Becattini's work incorporates historical time in a precise manner, analyzing economic processes located in space and time.

The Italian economist Paolo Sylos Labini in his work *Elementi di dinamica economica* emphasized the fact that the distinction between logical time, real time and historical time can also be of great interest to display a mode of research in economics which combines relevance and rigor. It tries to give explanations concerning relevant economic processes in an analysis which integrates rigorous methods, including, as Schumpeter did, theory, quantification and history. In this work, Becattini, with his studies on the Marshallian Industrial District, brought to contemporary economic analysis, a way of doing economics using Marshallian methodology, which includes a theory about and a knowledge of reality, and a study of economic processes in historical time. Thus, he builds a significant part of the «economic theory of the future» proposed by Schumpeter.

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